STANDARD OPERATING PROCEDURES

VOLUME VI OF V
AIR

ROCKY FLATS PLANT
ENVIRONMENTAL MONITORING AND ASSESSMENT DIVISION
P O Box 464
Golden CO 80402

February 1991

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AIR

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ENVIRONMENTAL ASSESSMENT AND MONITORING DIVISION

STANDARD OPERATING PROCEDURES

VOLUME VI OF VI
AIR

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ROCKY FLATS PLANT

ENVIRONMENTAL ASSESSMENT AND MONITORING DIVISION

STANDARD OPERATING PROCEDURES

VOLUME VI: AIR

TITLE
EFFLUENT TRITIUM SAMPLE COLLECTION

Approved By

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2 0 PURPOSE AND SCOPE

This procedure establishes requirements for sampling tritium in effluent air originating from areas whose processes involve materials containing or having the potential for tritium contamination

This procedure applies to the requirements for exchanging tritium sample bottles from effluent exhaust systems venting to the atmosphere and addresses (1) tritium sample bottle preparation, (2) tritium sample bottle collection, and (3) sample disposition

3 0 RESPONSIBILITIES

Personnel typically performing this work are qualified Radiation Protection Technologists (RPTs) who are matrixed on a full-time basis to Environmental Monitoring and Assessment Division (EMAD) for the purpose of performing environmental and effluent sampling responsibilities EMAD is responsible for the indoctrination and the hands-on environmental training of matrixed individuals

Managers of matrixed RPT personnel must make certain these personnel are properly trained and fully qualified before their assignment to perform the work

Radiological protection foremen supervise RPT training and building indoctrinations

RPTs matrixed to EMAD have the following responsibilities

- Enforce the chain-of-custody protocol during each phase of sample preparation, exchange and record-keeping activities
- Prepare tritium sample bottles for sample collection

- Collect the required samples, prepare them for analysis
- Record pertinent sampling data
- Deliver samples to the 123 H&S Laboratory
- Distribute associated paperwork

3 1 PREREQUISITES

The following prerequisites must be met by personnel involved with effluent tritium sample collection

- Personnel performing the work described in this procedure shall have received required training and have a current building indoctrination for every building in which the work will be performed
- Matrixed RPTs must have successfully completed all training mandated by Radiological Operations
- In addition to the above requirements, matrixed RPTs shall receive on-the-job training and general instruction in the execution of their job responsibilities
- Effluent air from exhaust plenums is sampled for tritium during its release to the atmosphere Samples of effluent air are collected at a point downstream from the final stage of HEPA filters

- Collect tritium effluent samples on Monday, Wednesday, and Friday each week Special samples may be scheduled at the mutual concurrence of both Operational Health Physics and EMAD

- EMAD will specify, in writing, any deviations from the normal collection frequency that may occur during holidays, shutdowns, or other nonroutine periods of operation.

4.0 REFERENCES

4.1 SOURCE REFERENCES

The following is a list of references reviewed prior to the writing of this procedure

EG&G Health and Safety Program Plan Rocky Flats Plan, Environmental Restoration October 26, 1990

EG&G Health and Safety Program Plan Rocky Flats Plan, Environmental Restoration October 26, 1990.

EG&G Radiological Operating Instructions Rocky Flats Plant

4.2 INTERNAL REFERENCES

5 0 PROCEDURES

5.1 DEFINITIONS

The following definitions are used in collecting effluent tritium samples

- Tritium, designated as H-3 or T or T-3 - A radioactive isotope of hydrogen, typically exists as a gas (H^3) or more commonly as tritium oxide (HTO) at RFP Tritium, a naturally occurring radionuclide, decays by beta particle emission (E_β = 18 Kev) to form stable He^3 The half-life of tritium is 12 5 years The low energy emissions, characteristic of tritium, require special detection and measurement techniques

- Chain-of-custody protocol - The process by which the sample media is under the control of the matrixed RPTs sampling personnel or the 123 H&S Laboratory personnel Chain-of-custody protocol makes certain that sample tampering or alteration, and misplacement whether deliberate or accidental does not occur

- Effluent Monitoring - The collection and analysis of samples or measurements of liquid and gaseous effluent for purposes of characterizing and quantifying contaminants, assessing radiation exposures of members of the public, and demonstrating compliance with applicable standards

- Tritium Sample Bottle - The tritium sample bottle is a four ounce glass bottle filled with double filtered deionized distilled water Sample bottles, with plastic caps are available through Baxter Scientific Products, Cat # B7451-6, 24/case @ $28.22/case Caps are available through Baxter Scientific Products, Cat # B7505-22 @ $3.39/package of 12

5.2 TRITIUM SAMPLE BOTTLE PREPARATION

The steps below should be followed when preparing tritium sample bottles

- Drive to the 123 H&S Laboratory

- Obtain six new tritium sample bottles and bottle caps from storage in Room #109B
- Obtain the 1 gallon bottle labeled double filtered deionized distilled water from 123 H&S Lab in Room #109B The 1 gallon jug should be equipped with a pipette dispenser
- If the 1 gallon bottle is empty or needs to be refilled, obtain the 5 gallon jug of deionized distilled water also stored in Room #109B
- If the 5 gallon jug is empty contact Lab personnel for a refill
- Remove the pipette dispenser from the 1 gallon bottle
- Fill the 1 gallon jug with deionized distilled water
- Reattach the pipette dispenser to the 1 gallon jug of deionized water
- Place a tritium sample bottle beside the 1 gallon jug of deionized distilled water
- Place the pipette dispenser's discharge tubing into the tritium sample bottle
- Pull up on the pipette dispenser's handle filling the pipette cylinder with 50 ml (one upward movement of the dispenser handle equals 50 mls)
- Push down on the pipette dispenser's handle depositing 50 ml of deionized water into the tritium sample bottle
- Repeat the two step above and deposit an additional 50 mls into the tritium

sample bottle The sample bottle should now have the required 100 ml of deionized water

- Remove the dispenser discharge tubing from the filled tritium sample bottle
- Obtain a black tritium sample bottle cap
- Place the cap on the tritium sample bottle ensuring a tight fit Do not overtighten
- Repeat the steps from placing the pipette dispenser/s discharge tubing into the tritium sample bottle through placing the cap on the tritium sample, until six tritium sample bottles have been prepared
- Complete the tritium sample bottle labels with Building location, date on, and date off, H_2O volume (H_2O volume = 72 x number of days the sample will be on, H_2O volume for two days = 1 44, H_2O volume for three days = 2 16), and collecting personnel's employee number or name
- Attach one label to each tritium sample bottle
- Place the filled tritium sample bottles into the tritium sample bottle carrier

5.3 TRITIUM SAMPLE COLLECTION

The steps below should be followed when collecting tritium samples

- Source calibrate a Ludlum 12-1A

- Obtain equipment and supplies required for the tritium sample collection

  - Ludlum 12-1A
  - Prepared tritium sample bottles and carrier
  - Surgeon's gloves
  - Respiratory protection
  - Respirator card
  - Building indoctrination card
  - Hazardous waste card
  - Exempt badge for PSZ
  - Tritium Travel and Chain of Custody Sheets

The respirator card, building indroctrination card, and hazardous waste card, is provided by training personnel after successful completion of required training. The respirator card requires a physical The exempt badge is provided by security and will allow the bearer to enter the PSZ on a frequent basis

- Drive to first building on the tritium sample route utilizing existing security procedures to access the controlled areas

- Contact Radiological Protection foreman to obtain a second person for two-man rule

- Change into company-furnished clothing per H&S Manual 18 02 as necessary to satisfy clothing requirements

- Proceed to first sampler location

- Don surgeon's gloves

- Source check the Ludlum instrument to verify that the instrument is functioning properly
- Locate the tritium sample bottle attached to the tritium sample holder, the bottle on the left side
- Care shall be taken while changing the sample bottles to avoid damaging the fritted dispersion tip or the gasket material
- Unscrew the tritium sample bottle from the tritium sample holder using care to avoid damaging the fritted dispersion tip or the gasket material
- Visually inspect the tritium sampler overflow bottle for liquid
- If liquid is present in the tritium sampler overflow bottle (bottle on the right in the tritium sample holder), unscrew overflow bottle from the tritium sample holder
- Pour the contents of the tritium overflow bottle into the tritium sample bottle
- Reattach the tritium overflow bottle to the tritium sample holder by screwing it back into place
- Check hands for possible contamination with the Ludlum instrument and change surgeon's gloves as necessary
- Remove the new tritium sample bottle, for the present location, from the tritium sample carrier
- Check the new tritium sample bottle label, and verify that the location on the label

matches the actual location of the tritium sampler

- Remove the black cap from the new tritium sample bottle for the present location
- Screw the black cap onto the just-collected tritium sample bottle
- Place the just-collected tritium sample into the tritium sample carrier
- Attach the new tritium sample bottle to the tritium sample holder by screwing the bottle into the holder, using care to avoid damaging the fritted dispersion tip or the gasket material
- Check hands for possible contamination with the Ludlum instrument and change surgeon's gloves as necessary.
- If radioactive contamination is found, decontaminate, as necessary, all sample bottles and equipment.
- Observe the air flow by checking the ball-bearing indicator, in the air rotameter, located at the top of the tritium sample holder
- Adjust, as necessary, by rotating the rotameter valve until the ball-bearing indicator is centered on the black line of the rotameter scale The black line will correspond to a sampling flow rate of 0.5 lpm
- Complete the Tritium Travel and Chain of Custody Sheet, noting any abnormal conditions (i.e , required maintenance, empty tritium sample bottles, etc)
- Proceed to the next tritium sampler location

- Repeat the steps from donning surgeon's gloves through completing the Tritium Travel and Chain of Custody Sheet until all tritium samples have been collected

- Follow the H&S procedures for exiting a control area

5.4 TRITIUM SAMPLE DISPOSITION

The steps below should be followed when disposing of tritium samples

- After all the tritium samples have been collected, deliver the tritium sample to the 123 H&S Lab receiving station along with the Tritium Travel and Chain of Custody Sheets

- Review with the 123 H&S lab personnel the number of samples collected

- Have the 123 H&S Lab personnel sign the Tritium Travel and Chain of Custody Sheet verifying that they have received the exact number of samples as recorded on the Tritium Travel and Chain of Custody Sheet.

- Remove the tritium sample bottles from the tritium sample bottle carrier

- Return the empty tritium sample carrier and other equipment to the supply storage area

5.5 TRITIUM SAMPLING LOCATIONS

Table 6 1-1 shows the tritium sampling locations.

TABLE 6.1-1. TRITIUM SAMPLING LOCATIONS

Exhaust System I.D	Collection Frequency
707-102	M-W-F
776-205	M-W-F
776-206	M-W-F
776-250	M-W-F
776-251	M-W-F
779-782	M-W-F

6.0 DOCUMENTATION

Form 6 1A presents the Tritium Travel and Chain of Custody Sheet

U.S. DEPARTMENT OF ENERGY ROCKY FLATS PLANT FORM 6.1A

Tritium Travel and Chain of Custody Sheet

Date On _____

Date Off _____

Location	Volume of Samples	Est Volume Collected	Comments	Est. Volume Received in Lab
707-102	100			
776-205	100			
776-206	100			
776-250A	100			
776-251-1	100			
782-401	100			

RPT _____ H&S Receiving _____

(4011 700)(air 1)(02/28/91)

TITLE
TRITIUM SAMPLER CALIBRATION

Approved By

10 TABLE OF CONTENTS

2 0 PURPOSE AND SCOPE

This procedure establishes requirements for calibrating tritium samplers at effluent air sampling locations

This procedure applies to requirements for calibrating Tritium samplers installed in effluent exhaust systems venting to the atmosphere and addresses (1) calibration frequency, (2) calibration procedures, (3) calibration paperwork, and (4) paperwork disposition

3 0 RESPONSIBILITIES AND QUALIFICATIONS

Personnel typically performing this work are qualified Radiation Protection Technologists (RPTs) who are matrixed on a full-time basis to Environmental Monitoring and Assessment Division (EMAD) for the purpose of performing environmental and effluent sampling responsibilities EMAD is responsible for the indoctrination and the hands-on environmental training of matrixed individuals

Managers of matrixed RPT personnel must make certain these personnel are properly trained and fully qualified before their assignment to perform the work.

Radiological protection foremen supervise RPT training and building indoctrinations

RPTs matrixed to EMAD perform the following duties

- Prepare supplies and equipment required during tritium sampler calibrations
- Perform tritium sampler calibrations
- Record pertinent calibration data

- Complete and affix calibration labels
- Distribute associated paperwork

3.1 PREREQUISITES

The following prerequisites must be met by all personnel involved with calibrating tritium samples

- Personnel performing the work described in this procedure will have received the training requirements and have a current building indoctrination for each building in which the work will be performed
- Matrixed RPTs must have successfully completed the training mandated by Radiological Protection
- Matrixed RPTs will receive on-the-job training and general instruction in the execution of their job responsibilities
- Calibration of the tritium samplers is to be performed during the first month of each calendar quarter, or whenever significant modifications to the exhaust system or tritium sampling apparatus are made
- EMAD will specify, in writing, any deviations from the normal calibration frequency that may occur during holidays, shutdowns, or other nonroutine periods of operation

3.2 REASONABLE PRECAUTIONS

Personnel performing these operations are required to take all reasonable precautions for

themselves and coworkers and perform only those tasks that they believe can be accomplished safely and in conformance with the existing rules and regulations. When personnel have doubts regarding safety of any phase of the work, the individual is required to check with the job supervisor before proceeding

4 0 REFERENCES

4 1 SOURCE REFERENCES

The following is a list of references reviewed prior to the writing of this procedure

EG&G Health and Safety Program Plan Rocky Flats Plant, Environmental Restoration October 26, 1990

EG&G Health and Safety Plan Workbook Rocky Flats Plant, Environmental Restoration October 26, 1990

EG&G Radiological Operating Instructions

4.2 INTERNAL REFERENCES

5 0 PROCEDURES

5 1 CALIBRATION PREPARATION

The steps below should be followed when preparing the calibration

- Determine calibration route

- Source calibrate a Ludlum 12-1A
- Obtain equipment and supplies required for the sampler calibrations

  - Ludlum 12-1A instrument
  - Calibrated rotameter
  - Plastic tubing and fitting
  - Kim wipes
  - Black grease pencil
  - Surgeon's gloves
  - Respiratory protection
  - Respirator card
  - Building indoctrination card
  - Hazardous waste card
  - Exemption badge for PSZ
  - Tritium Calibration Worksheets

- Check the calibration sticker on the calibration rotameter, and verify that the rotameter calibration expiration date has not been exceeded

- Check the rotameter's calibration label to verify that the calibration label indicates the point which corresponds to a airflow rate of 0.5 lpm (500 cc/min)

- If the calibration label does not indicate a point which corresponds to 0 5 lpm, obtain a rotermeter that conforms to the above stated criteria

5.2 TRITIUM SAMPLER CALIBRATION

The steps below should be followed when calibrating the tritium sampler

- Drive to the first building on the calibration route utilizing existing security procedures to access controlled areas
- Contact Radiological Protection foreman and obtain second person to satisfy the two-man rule
- Change into company-furnished clothing per H&S Manual 18 02, as necessary, to satisfy clothing requirements
- Proceed to the first tritium sampler location
- Don surgeon's gloves.
- Locate the tritium sampler flowrate meter The sampler flowrate meter is located at the upper left side of the tritium sampler
- Obtain a kim wipe
- Remove the black grease pencil mark from the sampler flowrate meter with the kim wipe
- Disconnect the airflow line from the bottom of the tritium sampler flowrate meter The airflow line is the line from the pitot tube (in the exhaust duct) which connects to the sampler flowrate meter
- Obtain the calibration rotameter
- Connect the airflow line, from the pitot tube, to the inlet (bottom) of the calibration rotameter

- Check hands on the Ludlum instrument for possible contamination and change surgeon's gloves as necessary
- Obtain the plastic tubing and a fitting.
- Connect one end of the plastic tubing to the rotameter outlet (top)
- Connect the other end of the tubing to the sampler flowrate meter inlet
- Check hands on the Ludlum instrument for possible radioactive contamination and change surgeon's gloves if necessary
- Locate the sampler vacuum valve The vacuum valve is located on the discharge line of the knockout bottle of the tritium sampler
- While observing the calibration rotameter, adjust the sampler vacuum valve until a flow of 0.5 lpm is obtained on the calibration rotameter
- Obtain the black grease pencil
- Place a line on the flowrate meter through the ball bearing indicator with the grease pencil
- Disconnect the calibration rotameter from the sampler flowrate meter, by disconnecting the plastic tubing at the bottom of the flowrate meter
- Disconnect the airflow line from the bottom of the calibration rotameter
- Connect the airflow line to the bottom of the sampler flowrate meter

- Observe the sampler flowrate meter to ensure that the ball-bearing indicator is still centered on the black grease pencil line
- If necessary, adjust the vacuum valve until the ball-bearing indicator is center on the black grease pencil line.
- Fill out a Tritium Calibration Label. Information includes calibration date, tritium sampler number, and the RPT's employee number or signature
- Affix the Tritium Calibration Label to the tritium sampler
- Complete the Tritium Sampler Calibration Worksheet. Required information includes calibration date, adjusted flowrate lpm, and initials of the RPT performing the calibration
- Visually inspect the tritium sampler apparatus to make certain that it is in good operating condition and that tritium sample bottle and knockout bottle are properly positioned.
- Note any problems with the calibration on the Tritium Calibration Worksheet in the comments column
- Proceed to the next sampler location
- Repeat the steps from driving to the first building on the calibration route through proceeding to the next sampler location, until all samplers have been calibrated

6 0 DOCUMENTATION

A Tritium Calibration Worksheet will be used to document the calibration of tritium samplers at effluent air sampling locations.

After the samplers have been calibrated, copy and deliver the original Tritium Calibration Worksheets to the EMAD Program Manager Place a copy of the Tritium Worksheet in the RPT file cabinet

TITLE
EFFLUENT AIR RADIOPARTICULATE
SAMPLE COLLECTION

Approved By:

1.0 TABLE OF CONTENTS

2 0 PURPOSE AND SCOPE

This procedure establishes the requirements for exchanging radioparticulate samples at effluent air sampling locations

This procedure applies to requirements for exchanging particulate filter sampling media from effluent exhaust systems venting to the atmosphere and addresses (1) sample preparation, (2) sample collection, and (3) sample disposition

3 0 RESPONSIBILITIES AND QUALIFICATIONS

Personnel typically performing this work are qualified Radiation Protection Technologists (RPTs) who are matrixed on a full-time basis to Environmental Monitoring and Assessment Division (EMAD) for the purpose of performing environmental and effluent sampling responsibilities EMAD is responsible for the indoctrination and the hands-on environmental training of matrixed individuals

Managers of matrixed RPT personnel must make certain these personnel are properly trained and fully qualified before their assignment to perform the work

Radiological Protection foremen supervise RPT training and building indoctrinations

RPTs matrixed to EMAD will perform the following tasks

- Enforce the chain-of-custody protocol during all phases of sample preparation, exchange and record keeping activities
- Stamp particulate filters with sampler location, date on and date off
- Collect the required samples, prepare them for analysis

- Record pertinent sampling data
- Deliver particulate filter to the 123 H&S Laboratory
- Distribute associated paperwork

3.1 PREREQUISITES

The following prerequisites must be met by the personnel involved with the collection of effluent air radioparticulate samples

- Personnel performing the work described in this procedure will have received the required training and have a current building indoctrination for each building in which the work will be performed
- Matrixed RPTs must have successfully completed the training mandated by Radiological Protection.
- Matrixed RPTs will receive on-the-job training and general instruction in the execution of their job responsibilities
- Effluent air from exhaust plenums is sampled during its release to the atmosphere. Samples of effluent air are collected at a point downstream from the final stage of HEPA filters
- EMAD will specify, in writing, any deviations from the normal collection frequency that may occur during holidays, shutdowns, or other nonroutine periods of operation

3.2 REASONABLE PRECAUTIONS

Personnel performing these operations are required to take reasonable precautions for themselves and coworkers and perform only those tasks that they believe can be accomplished safely and in conformance with the existing rules and regulations When personnel have doubts regarding safety of any phase of the work, the individual is required to check with the job supervisor before proceeding

4 0 REFERENCES

4.1 SOURCE REFERENCES

4.2 INTERNAL REFERENCES

The following is a list of references reviewed prior to the writing of this procedure

EG&G Health and Safety Program Plan Rocky Flats Plant, Environmental Restoration October 26, 1990.

EG&G. Health and Safety Plan Workbook Rocky Flats Plant, Environmental Restoration October 26, 1990

EG&G Radiological Operating Instructions Rocky Flats Plant

5 0 PROCEDURES

5 1 DEFINITIONS

The following definitions are used during the effluent air radioparticulate sample collection process

- Chain-of-custody protocol - The process by which the sample media is under the control of the matrixed Radiation Protection sampling personnel or the 123 H&S Laboratory personnel Chain-of-custody makes certain that sample tampering, alteration, and misplacement whether deliberate or accidental, does not occur

- Particulate filter - The 47 mm glass microfibre particulate filter media (EPM-2000) manufactured by Whatman International Limited The particulate filter is available through M&S (M&S cat # is 014 03 08 01) or through Baxter Scientific (cat # F-2836-4, @ $12.15/box of 100)

5.2 INSTRUCTIONS

5.2.1 Sample Preparation

The steps below should be followed in preparation of collecting effluent air radioparticulate samples

- At the beginning of each month, deliver five boxes of EMP-2000 Whatman particulate filters to the 123 H&S Laboratory The filters delivered to the labs must be of the same lot number that will be used for sample collection during the month

- Determine which sample route particulate filters are being prepared for On Monday or Thursday, the sample route is PSZ (Hotside) On Tuesday or Friday, the sample route is non-PSZ (Coldside)

- Obtain particulate filters, #EPM-2000, with the same lot number as lot those delivered to the 123 H&S labs in the first step, above

- Count out the number of particulate filters required for the sample route The PSZ (Hotside) requires 95 filters The non-PSZ (Coldside) requires 38 filters

- Inspect each particulate filter and determine the rough side versus the smooth side
- Make certain the surface of desk or table is clean and free of possible radioactive contamination to provide for accurate laboratory analyses
- Locate a clean, flat surface that is free from possible radioactive contamination
- Lay the particulate filters on the flat surface smooth side down rough side up
- Obtain a hand-held numerical stamping machine
- Stamp each particulate filter with a corresponding location number for each sampler location The location number must be centered on the particulate filter The location number includes the building number, plenum number and sampler number as applicable
- Obtain a date stamper, and set the date for the next sample start period
- Stamp each particulate filter with the start date (date on) at the top of the particulate filter. The date on is the date the particulate filter is to be installed
- Determine the date of the next, or the following, sample collect period The date off is the date the particulate filter is to be collected
- Set date stamp to the date off
- Stamp each particulate filter at the bottom with the date off
- Make certain each particulate filter is in a brass ring to avoid cross-contamination

during the sample collection procedures

- Obtain brass ring filter holders from supply cabinet
- Inspect brass ring filter holders and determine grooved surface of inter edge side
- Place each brass ring on the desk grooved side up
- Place the particulate filter for each sampler location into the brass rings with the stamped side up

If preparing PSZ samples, take the following steps:

- Load the sample tube carriers by the normal route sequence The first sample location should be loaded in the sample tube carrier first
- Place the loaded brass ring (with the particulate filter) into the sample carrier tube, stamped side up.
- Repeat the steps from loading the sample tube carrier through placing the loaded brass ring into the sample carrier tube, until all particulate filters in brass rings for each sample location are loaded into the sample carrier tubes
- Verify that you have two sample tube carriers

If preparing non-PSZ samples, take the following steps

- Load samples into glassine envelopes

- Obtain 38 glassine envelopes
- Place the particulate filter for first sampler location into a glassine envelope
- Place the particulate filter for the next sampler location into a glassine envelope and stack on top of the first glassine envelope
- Repeat placing the particulate filters into the glassine envelopes, until all particulate filters are loaded into glassine envelopes and are stacked, first location on bottom to last location on top

5.2.2 Sample Collection

The steps below should be taken when collecting the samples

- Source calibrate a Ludlum 12-1A per ROI
- Obtain equipment and supplies required for the sample collection
  - Ludlum 12-1A instrument
  - Prestamped samples in tube carriers (PSZ) or glassine envelopes (non-PSZ)
  - Surgeon's gloves
  - Respiratory protection
  - Respirator card
  - Building indoctrination card
  - Hazardous waste card
  - Exemption badge for PSZ
  - Effluent Travel and Chain of Custody Sheets

- Drive to the first building on the sample route, utilizing existing security procedures to access controlled areas
- Contact Radiological Protection foreman and obtain second person to satisfy two-man rule Several of the sampler locations are not within a controlled area and are not subject to the two-man rule for controlled areas
- Change into company-furnished clothing per H&S Manual 18 02 for the PSZ or 18 03 for the non-PSZ, as necessary, to satisfy clothing requirements
- Proceed to the first sampler location.
- Don surgeon's gloves
- Source check Ludlum instrument to verify that the instrument is functioning properly
- Unscrew the filter holder cap, and separate the holder exposing the particulate filter
- Using the Ludlum's probe, check the particulate filter for radioactive contamination and ensure that count is below 2500 cpm.
- When removing the sample media from the samplers, exercise extreme care and avoid touching the particulate filter and risking cross-contaminating subsequent samples

If collecting PSZ samples, take the steps below

- Remove the brass ring and particulate filter from the sample holder
- If the count is above 2500 cpm, place the particulate filters into glassine envelopes

instead of the sample tube carrier

- Place the just removed sample into the top of the sample tube carrier when the sample is below the 2500 cpm limit.
- Check hands for possible contamination and change surgeon's gloves as necessary
- Remove from the bottom of the sample tube carrier the new replacement brass ring and particulate filter

If collecting non-PSZ samples, take the steps below

- Remove the appropriate new replacement brass ring and particulate filter from its glassine envelope.
- Remove the brass ring and particulate filter from the sample holder
- Place the brass ring and particulate filter from the sample holder into the glassine envelope
- Check hands for possible contamination and change surgeon's gloves as necessary.
- Verify that the new particulate filter's location number corresponds to the actual sampler location.
- Install the new particulate filter into the sample holder with the stamped side visible
- Screw the sample holder cap and sample holder body together

- Check hands on the Ludlum instrument for possible radioactive contamination and change surgeon's gloves if necessary

- Visually check the volume totalizer display reading. (Volume totalizers are not installed on all of the effluent air stacks. The Effluent Travel and Chain of Custody Sheets will have shaded cells in the Effluent Volume column indicating locations without volume totalizers)

- Record the totalizer display reading on the Effluent Travel and Chain of Custody Sheet

- Press the volume totalizer reset button to zero the volume totalizer display

- Make notations on the Effluent Travel and Chain of Custody Sheet for number of samples collected and any abnormal occurrences during sample collection Example volume totalizer sticking, maintenance requirements, safety related problems, sampler inaccessibility etc.

- Continue to next sampler location

- Repeat the steps from contacting the Radiological Protection foreman through continuing to the next sampler location, until all samples location have been collected

- Follow the H&S procedures for exiting a control area

5.2.3 Sample Disposition

The steps below should be followed when disposing of samples

- After all filters for the route have been collected, deliver the samples to the 123 H&S Lab receiving station, along with the Effluent Travel and Chain of Custody Sheets.

- Review with the 123 H&S Lab personnel the number of samples collected by sampler location

- Have the 123 H&S Lab personnel sign the Effluent Travel and Chain of Custody Sheet verifying that they have received the exact number of samples as recorded on the Effluent Travel and Chain of Custody Sheet

- Pick up empty sample tube carriers and brass rings from previous sample collections

- Return empty sample tube carriers and brass rings to the supply storage area

5.3 SAMPLING LOCATIONS

Attachment 6.3A shows the PSZ sampling locations Attachment 6.3B shows the non-PSZ sampling locations

6.0 DOCUMENTATION

The Effluent Travel and Chain of Custody Sheet for PSZ and non-PSZ sampling locations will be used to track the movement of effluent air radioparticulate samples collected in PSZ and non-PSZ sampling locations (Form 6.3A)

Attachment 6.3A. PSZ Sampling locations

Exhaust System ID	Collection Frequency		Analytical Frequency					
	n	FPS	H-3	TLL-a	H-3	Pu	Am	UBe
371-N01	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
371-N02	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
371-SSS	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
374-MAI	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
374-SPD	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
559-561	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-101	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-102	2	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
707-105	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-106	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-107	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-108	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R21	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R22	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R23	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R24	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R25	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R26	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R27	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R45	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R46	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
771-CMA	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
771-CRM	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
771-MAI	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
774-202	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-201	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-202	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-204	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-205	2	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-206	2	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-207	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-250	5	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-251	3	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-252	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
778-LDY	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
779-729	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
779-782	3	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
991-985	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
991-MAI	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)

MC = Monthly Composite

Attachment 6.3B non-PSZ Sampling locations

Exhaust System ID	Collection Frequency n	Collection Frequency FPS	Analytical Frequency H-3	Analytical Frequency TLL-a	Analytical Frequency H-3	Analytical Frequency Pu	Analytical Frequency Am	Analytical Frequency U	Analytical Frequency Be
444-D05	1	TuFr	-	TuFr	-	-	-		(MC)(MC)
444-MAI	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
447-MA	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
865-EEE	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
865-WWW	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
881-MA	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
881-MA2	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
881-MA3	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
881-MA4	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
883-AAA	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
883-BBB	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
883-CCC	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
886-875	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
889-MA	1	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)

MC = Monthly Composite

Effluent Travel and Chain of Custody Sheet

Form 6.3A

Date On _____

Date Off _____

Location	Number of Samples	Number Collected	Effluent Volume	Comments	Samples Received in Lab
371-123	3				
371-456	3				
371-789	3				
374-123	3				
374-456	3				
559-561	3				
707-101	2				
707-102	2				
707-105	3				
707-106	2				
707-107	3				
707-108	3				
707-R21	2				
707-R22	2				
707-R23	2				
707-R24	2				
707-R25	2				
707-R26	2				
707-R27	2				
707-R45	2				
707-R46	2				

RPT_____ H&S Receiving_____

Effluent Travel and Chain of Custody Sheet

Form 6.3A

Date On _____

Date Off _____

cation	Number of Samples	Number Collected	Effluent Volume	Comments	Samples Received in Lab
771-CMA	2				
771-CRM	2				
771-MA2	3				
774-202	2				
776-201	2				
776-202	2				
776-204	3				
776-205	2				
776-206	2				
6-207	2				
776-250	4				
776-251	3				
776-252	2				
778-LDY	2				
779-782	2				
985-123	3				
991-ABC	3				

RPT_____ H&S Receiving_____

Effluent Travel and Chain of Custody Sheet

Form 6.3A

Date On _____

Date Off _____

Location	Number of Samples	Number Collected	Effluent Volume	Comments	Samples Received in Lab
441-MAI	3				
444-D05	1				
447-MAI	3				
865-EEE	3				
865-WWW	3				
886-875	3				
881-NE	3				
881-NW	3				
881-SW	3				
881-SE	3				
883-456	3				
883-123	3				
883-CCC	3				
889-MAI	1				

RPT_____ H&S Receiving_____

TITLE
EFFLUENT AIR RADIOPARTICULATE
SAMPLER CALIBRATION

Approved By

1.0 TABLE OF CONTENTS

2.0 PURPOSE AND SCOPE

This procedure establishes the requirements for calibrating radioparticulate samplers at effluent air sampling locations

This procedure applies to requirements for calibrating particulate filter samplers installed in effluent exhaust systems venting to the atmosphere and addresses (1) calibration frequency, (2) calibration procedures, (3) calibration paperwork, and (4) paperwork disposition

3.0 RESPONSIBILITIES AND QUALIFICATIONS

Personnel typically performing this work are qualified Radiation Protection Technologists (RPTs) who are matrixed on a full-time basis to Environmental Monitoring and Assessment Division (EMAD) for the purpose of performing environmental and effluent sampling responsibilities EMAD is responsible for the indoctrination and the hands-on environmental training of matrixed individuals

Managers of matrixed RPT personnel must make certain these personnel are properly trained and fully qualified before their assignment to perform the work

Radiological Protection foremen supervise RPT training and building indoctrinations

RPTs matrixed to EMAD will perform the following tasks

- Prepare supplies and equipment required during sampler calibrations.
- Perform effluent air sampler calibrations
- Record pertinent calibration data

- Complete and affix calibration labels.

- Distribute associated paperwork.

3.1 PREREQUISITES

The following prerequisites must be met by the personnel involved with the calibration of effluent air radioparticulate samples

- Personnel performing the work described in this procedure shall have received all training requirements and have a current building indoctrination for every building in which the work will be performed

- Matrixed RPTs must have successfully completed the training mandated by Radiological Protection.

- Matrixed RPTs will receive on-the-job training and general instruction in the execution of their job responsibilities

- Calibrations of the effluent air samplers once each calendar quarter or whenever significant modifications to the exhaust system or effluent sampling equipment are made

- EMAD will specify, in writing, any deviations from the normal calibration frequency that may occur during holidays, shutdowns, or other nonroutine periods of operation.

3.2 REASONABLE PRECAUTIONS

Personnel performing these operations are required to take reasonable precautions for themselves and coworkers and perform only those tasks that they believe can be accomplished safely and in conformance with the existing rules and regulations When personnel have doubts regarding safety of any phase of the work, the individual is required to check with the job supervisor before proceeding

4.0 REFERENCES

4.1 SOURCE REFERENCES

The following is a list of references reviewed prior to the writing of this procedure

EG&G Health and Safety Program Plan Rocky Flats Plant, Environmental Restoration October 26, 1990

EG&G Health and Safety Plan Workbook Rocky Flats Plant, Environmental Restoration October 26, 1990

EG&G Radiological Operating Instructions

4.2 INTERNAL REFERENCES

5.0 PROCEDURES

5.1 DEFINITIONS

The Kurz flow meter precision instrument used to measure and calibrate air flow volume in liters

per minute will be used during the effluent air radioparticulate sampler calibration process.

5.2 CALIBRATION PREPARATION

The steps below should be followed when preparing the effluent air radioparticulate sampler calibration

- Determine calibration route
- Source calibrate a Ludlum 12-1A.
- Obtain equipment and supplies required for the sampler calibrations·
  - Ludlum 12-1A instrument
  - Kurz flow meter
  - Red gauge oil
  - Surgeon's gloves
  - Respiratory protection
  - Respirator card
  - Building indoctrination card
  - Hazardous waste card
  - Exemption badge for PSZ
  - Effluent Calibration Worksheets
  - Screwdriver
  - Pliers
  - Filter holder screw cap
  - EMP-2000 particulate filters
  - Brass ring filter holder
  - Small adjustable wrench

- Check the calibration sticker on the Kurz flow meter, and verify that the flow meter calibration expiration date has not been exceeded.

- Perform a battery check of the Kurz flow meter by placing the selector switch to the "Battery Check" position and verifying that the meter is within the operating range

5.3 SAMPLER CALIBRATION

To perform the sampler calibration, follow the steps below:

- Drive to the first building on the sample route utilizing existing security procedures to access controlled areas

- Contact Radiological Protection foreman and obtain second person to satisfy two-man rule. (Several of the sampler locations are not within a controlled area and are not subject to the two-man rule for controlled areas)

- Change into company-furnished clothing per H&S Manual 18 02, as necessary, to satisfy clothing requirements

- Proceed to the first sampler location

- Don surgeon's gloves

- Source check Ludlum instrument to verify that the instrument is functioning properly

- Unscrew the filter holder cap, and separate the holder exposing the particulate filter
- Using the Ludlum's probe, check the particulate filter for radioactive contamination
- When removing the sample media from the samplers, exercise extreme care and avoid touching the particulate filter and risking cross-contamination
- Remove the brass ring and particulate filter from the sample holder
- Check hands for possible contamination and change surgeon's gloves as necessary
- Install a new particulate filter into the sample holder
- Screw the extra filter holder cap onto filter holder body that holds the new filter
- Check hands on the Ludlum instrument for possible radioactive contamination and change surgeon's gloves if necessary
- Perform a battery check of the Kurz flow meter
- Turn the Kurz flow meter selector switch to "operate" and check that it "zeros "
- Attach the flow meter adapter to the filter cap holder
- Visually read the sampler flow rate on the Kurz flow meter
- Record the "as found" flow rate on the Effluent Calibration Worksheet

- Close the flow control valve
- Visually note the U-tube manometer oil level
- Record the manometer oil level on the Effluent Calibration Worksheet.
- Obtain a zero reading on the manometer scale by adjusting the scale up or down as required
- To adjust the manometer scale, loosen the manometer scale set screw with a screwdriver
- Move the scale up or down until the zero position on the scale is level with the oil in the U-tube
- If the zero on the manometer scale cannot be leveled with the oil in the U-tube, add Red gauge oil to the U-tube until a zero reading can be obtained
- Note on the Effluent Calibration Worksheet that gauge oil was added to the manometer
- Tighten the set screw with a screwdriver
- Slowly open the flow control valve until a meter reading between 55 and 60 lpm is obtained
- Visually note the manometer oil level which corresponds to the sample flow rate of 55 to 60 lpm

- Record the manometer oil level on the Effluent Calibration Worksheet
- Fill out an Effluent Calibration Label. The required information includes building number, sampler location, date, RPT's employee number or signature, and manometer oil level.
- Affix the Effluent Calibration Label on the wall adjacent to the manometer
- Turn off the Kurz flow meter
- Remove the adapter from the filter cap
- Remove the brass ring and particulate filter installed earlier and discard
- Install the original particulate filter that was removed during the calibration
- Visually inspect the sampling apparatus to ensure it is in good operating condition and that O-rings and grids are properly positioned
- Screw the original filter holder cap and filter holder together
- Note any problems with the calibration on the Effluent Calibration Worksheet in the comments column
- Proceed to the next sampler location
- Repeat the steps from driving to the first building on the sample route through proceeding to the next sampler location, until all samplers have been calibrated

6.0 DOCUMENTATION

Effluent Calibration Worksheets will be used to document the calibration activities of radioparticulate samplers at effluent air sampling locations

After the samplers have been calibrated, copy and deliver the original Effluent Calibration Worksheets to the EMAD Program Manager Place a copy of the worksheet in the RPT file cabinet

TITLE
RESPONSE TO EFFLUENT
SAAM ALARM

Approved By

10 TABLE OF CONTENTS

2 0 PURPOSE AND SCOPE

Selective Alpha Air Monitors (SAAMs) are located in ventilation systems to provide automatic alarms if abnormal alpha activity is detected in the exhaust system. This standard operating procedure (SOP) establishes a comprehensive, formal procedure for response to an effluent SAAM, i e , Radeco, Model 441

This procedure applies to the evaluation and the subsequent response to an "out of tolerance" condition existing in an effluent air ventilation system.

3.0 RESPONSIBILITIES

The Environmental Monitoring and Assessment Division (EMAD) directs and coordinates activities associated with responding to a SAAM alarm

Radiation Instrumentation and Radiation Protection perform calibration and maintenance at set alarm points on the SAAMs. Radiation Protection involves conducting routine particulate filter changes and ensuring proper marking and filter identification Radiation Protection will also include verifying and validating all SAAM alarms

Radiation Protection Supervision is responsible for conducting notification of the personnel listed in 5 1 in the event of a verified alarm

The H&S Laboratory will conduct radiochemical analysis on the SAAM particulate filters The laboratory will also conduct radiochemical analysis on the routine effluent air particulate filters

EMAD, Utilities, and Health Physics will determine the appropriate course of action following an alarm

3 1 PREREQUISITES

The following prerequisites must be fulfilled to properly meet SAAM alarm procedures

- The alarm points of all existing effluent SAAMs are set at 15 counts/minute (i e , 30 percent of full scale on the 50 count/minute range scale)

- Effluent air SAAM units are adjusted to sample at a flow rate of 56 6 liters/minute (2 cfm, actual) This effluent sample extraction is accomplished through a pitot-type sampling tube The pitot tube is sized to make certain the sample is collected under near-isokinetic flow conditions

- The particulate filter media is 47 mm diameter, Whatman EPM 2000 filter media.

- The particulate filter paper media is changed on a frequency that corresponds to the changing of the routine effluent particulate filters (see EMA-103) This normally corresponds to the routine Monday, Thursday or Tuesday, Friday collection schedule

4.0 REFERENCES

4.1 SOURCE REFERENCES

4.2 INTERNAL REFERENCES

5.0 PROCEDURES

5.1 RESPONSE TO THE SAAM ALARM

Upon receiving a SAAM alarm indicating an "out of tolerance" condition, the Radiological Protection area should take the following steps

- Immediately change the particulate filter in the affected unit
- Replace the particulate filter with fresh, unused particulate filter paper
- To check the validity of the alarm, count the suspect particulate filter using the appropriate alpha-detecting instrumentation
- Verify the alarm's validity, by observing an out of limit count using alpha-detection instrumentation
- Place the particulate filter into a glassine envelope
- Notify the following that a valid effluent SAAM alarm has occurred Make this notification whenever a verified alarm occurs, irrespective of the time of day
    - L C Pauley, 273-6068 or home, 642-0557, or
    - R G Porter, 273-6191
    - Utilities for the affected building
    - Operation Management
    - Health Physics
- Identify the particulate filter with the ventilation system number, an estimate of the total air volume of the sample, and the date and time of the occurrence

- Submit the particulate filter to the 123 H&S Laboratory for specific analytical analysis, as determined by EMAD.

Upon receiving a SAAM alarm, the utilities supervision personnel should provide recommendations concerning the advisability of reducing or curtailing the effluent ventilation from the affected area(s)

If a SAAM alarm occurs, the Operation Management area should identify all operations that are connected to the affected ventilation system In addition, they should perform shutdown procedures on operations that are not already shutdown

The EMAD should notify the matrixed RPT to replace and properly identify the routine effluent particulate filters from the affected ventilation system The division should also notify EMAD management and DOE's Environmental Organization that a valid effluent SAAM alarm has occurred

The matrixed RPT should collect the effluent air particulate filters from the affected ventilation system per the Effluent Air Sample Collection procedure The RPT should submit these effluent samples to the 123 H&S Laboratory per the Effluent Air Sample Collection procedure for specific laboratory analysis

The 123 H&S Laboratory should analyze the SAAM particulate filter per EMAD instructions The laboratory should also analyze the routine effluent particulate filters per EMAD instructions, and provide particulate filter analyses to EMAD

5.2 POST-SAAM ALARM CRITIQUE

Building Management should initiate a critique to ascertain the cause for the condition. Building management should also form a critique team composed of the following members (or alternates)

that shall determine the cause and appropriate corrective actions

- 1 member - Radiation Protection Supervision
- 1 member - Environmental Monitoring and Assessment Division
- 1 member - Operational Health Physics
- 1 member - Building Utilities
- 1 member - Designated by the Building Operations Manager
- 1 member - Supervisor from the process area giving rise to the alarm condition
- 1 member - Health and Safety Area Safety Representative
- 1 member - Building Supervisor

Building management will be responsible for preparing a final report of the occurrence including details of the occurrence, and assigning any corrective actions that are to be taken They will also follow up on corrective actions until the corrective actions have been completed

5.3 QUALITY CONTROL

Radiation Instrumentation will perform a periodic operational check and detector calibration of each SAAM

Radiation Monitoring will calibrate the SAAM flowrate and conduct routine particulate filter changes.

5 4 PROCEDURE CONTROL

The EMAD should perform an annual review of this procedure, or conduct a review at any time the procedure is determined to be inadequate for accomplishing the objective The EMAD manager will review, revise, and approve all changes to this procedure

6 0 DOCUMENTATION

After the matrixed RPT has collected the effluent air particulate filters from the affected ventilation system, these filters must be submitted to the 123 H&S Laboratory for specific laboratory analysis The 123 H&S Laboratory should analyze the SAAM particulate filters according to EMAD instructions, and provide particulate filter analysis to EMAD

TITLE
EFFLUENT AIR PITOT TUBE INSPECTION AND REPLACEMENT

Approved By:

1.0 TABLE OF CONTENTS

2.0 PURPOSE AND SCOPE

This procedure specifies requirements for routine periodic inspection of effluent air sampling pitot tubes and replacement of defective pitot tubes. Inspection of effluent air sampling pitot tubes is performed to make certain that these tubes are in functional condition

This procedure applies to requirements for the inspection of effluent air sampling pitot tubes, and the replacement of defective pitot tubes installed in the effluent exhaust systems venting to the atmosphere and addresses (1) personnel requirements (2) pitot tube inspection, (3) pitot tube replacement, and (4) the associated paperwork

3.0 RESPONSIBILITIES AND QUALIFICATIONS

The Environmental Monitoring and Assessment Division (EMAD) is responsible for the following tasks

- Develop the schedule for the pitot tube inspections
- Provide Maintenance with specifications for replacement pitot tubes
- Review and maintain the Pitot Tube Inspection and Replacement Report
- Make arrangements to obtain services of maintenance personnel to accompany the inspector

Maintenance is responsible for providing support personnel to aid in removing and replacing the pitot tubes during the inspection Maintenance will also fabricate pitot tubes needing replacement in accordance with specifications provided by EMAD

Managers of matrixed Radiation Protection Technologists (RPTs) and personnel are typically qualified RPTs who are matrixed on a full-time basis to EMAD for the purpose of performing environmental and effluent sampling responsibilities. EMAD is responsible for the indoctrination and the hands-on environmental training of the matrixed individuals. The managers must make certain these personnel are properly trained and fully qualified before their assignment to perform the work

Radiological Protection foremen will supervise RPT training and building indoctrinations They will also provide additional RPT support for contamination control during the inspection procedure, and accompany matrixed RPT and maintenance personnel during the inspection

RPTs matrixed to EMAD are responsible for the following tasks

- Installation of any required contamination control cells
- Inspection of pitot tubes
- Determine if pitot tube replacement is required
- Record pertinent pitot tube inspection and replacement data
- Distribute associated paperwork

3.1 PREREQUISITES

The following prerequisites must be met by the personnel involved with effluent air pitot tube inspection and replacement

- Personnel performing the work described in this procedure will have received the

required training and have a current building indoctrination for each building in which the work will be performed.

- Matrixed RPTs must have successfully completed all training mandated by Radiological Protection

- Matrixed RPTs will receive on-the-job training and general instruction in the execution of their job responsibilities

- EMAD will specify, in writing, any deviations from the normal pitot tube inspections and replacement frequency that may occur during holidays, shutdowns, or other nonroutine periods of operation

- A periodic inspection (maximum 2-year interval) is intended as preventive maintenance for detecting damage through normal usage and removal or replacement

4.0 REFERENCES

4.1 SOURCE REFERENCES

4.2 INTERNAL REFERENCES

5.0 PROCEDURES

5.1 PITOT TUBE INSPECTION AND REPLACE PREPARATION

The following steps should be taken to properly complete the pitot tube inspection and replacement

- Maintenance personnel assigned to the pitot tube inspection and replacement job will provide wrenches, pliers, or other hand tools suitable for removing the pitot tube from its mounting assembly

- The additional RPT will obtain a Ludlum 12-1A instrument

- Source check the Ludlum 12-1A instrument to verify that the Ludlum is working properly

- Obtain kim wipes for smearing for possible radioactive contamination

- Obtain equipment and supplies required for the sample collection:

  - Replacement pitot tubes
  - Respiratory protection
  - Respirator card
  - Building indoctrination card
  - Hazardous waste card
  - Exemption badge for PSZ
  - Effluent Pitot Tube Inspection and Replacement Report
  - Flashlight

5.2 PITOT TUBE INSPECTION

The following steps will be taken to properly perform the pitot tube inspection

- Drive to the first building on the pitot inspection and replacement schedule utilizing existing security procedures to access controlled areas

- Obtain additional equipment and supplies required for the sample collection

  - Surgeon's gloves
  - Kim wipes
  - Plastic bags
  - 2-inch yellow tape

- Contact Maintenance foreman and obtain maintenance support personnel

- Contact Radiological Protection foreman and obtain the additional RPT

- Change into company-furnished clothing per H&S Manual 18 02 for the PSZ or 18 03 for the non-PSZ as necessary to satisfy clothing requirements

- Many of the effluent sampling pitot tubes requiring inspection are located on top of plenums or in elevated ductwork These areas tend to be poorly lighted with limited headroom While performing the inspection, exercise care and take all necessary precautions when climbing stairways, catwalks, etc., while gaining access to these locations

- Proceed to the first effluent sampler location

- Don surgeon's gloves

- The contamination control RPT will perform a smear check of the immediate area surrounding the pitot tube mounting assembly, and monitor decontamination if required

- The matrixed RPT will don respiratory protection and decontaminate the area as required The matrixed RPT will install contamination control measures

- The maintenance person will don respiratory protection and remove the nuts that hold the pitot tube mounting assembly to the exhaust duct After the nuts are removed, the matrixed RPT will observe the manometer while the pitot tube mounting assembly is being removed from the exhaust duct

- The matrixed RPT will note any sudden decrease in the manometer's differential pressure reading A drop may indicate a partial blockage of the sampling tube

- The Maintenance personnel will slowly remove the pitot tube assembly from the exhaust duct using care to avoid damage to the pitot tube Extreme care must be exercised when the pitot tube mounting assembly is removed from the exhaust duct In most cases, the removal is accomplished with some difficulty Any damage to the pitot tube, such as bending or kinking, will necessitate replacement

- The contamination control RPT will smear check the pitot tube and pitot tube mounting assembly for radioactive contamination If no detectable contamination is found, proceed with the inspection of the pitot tube

- If detectable contamination is found, the matrixed RPT must clean the pitot tube using the appropriate decontamination procedures Continue and complete the tube inspection

- The matrixed RPT will visually inspect the pitot tube for signs of deterioration A pitot tube is considered damaged if the integrity of air passing through the pitot tube is altered to the extent that the filter paper sample is compromised

- Inspect the sharp, tapered portion of the tube for signs of corrosion and "nicks and dings" that may have resulted from impaction

- Inspect the pitot tube along its length for kinks and bends.

- Inspect the pitot tube for plugging.

- Determine if the pitot requires replacement

- Note findings on the Pitot Tube Inspection and Replacement Log.

5.3 PITOT TUBE REPLACEMENT

The following steps will be taken to properly complete the pitot tube replacement

- Replace any pitot tubes showing signs of deterioration or damage

- The matrixed RPT must obtain the replacement pitot tube

- Check the pitot tube dimensions (i.e., identification, and length) and verify that dimensions of replacement pitot tube has identical inside diameter and length as that of the tube being replaced. Pitot tube dimensions are, in many instances, unique to their particular location, so care must be taken that any new pitot tubes replacing damaged pitot tubes are properly sized

- The maintenance personnel should remove the pitot tube from the pitot tube mounting assembly

- The matrixed RPT will obtain a plastic bag and yellow tape

- Place the damaged pitot tube into the plastic bag
- Tape the plastic bag shut with yellow tape
- The contamination control RPT must check the hands of the matrixed RPT for possible radioactive contamination.
- The matrixed RPT will change surgeon's gloves as necessary
- Maintenance personnel will install the replacement pitot tube onto the pitot tube mounting assembly, making sure that the nozzle opening is directed into the airflow
- The contamination control RPT must check the hands of the maintenance personnel for possible radioactive contamination
- Maintenance personnel will change surgeon's gloves as necessary
- The matrixed RPT will document all findings on the Pitot Tube Inspection and Replacement Log, and make sure that any detectable contamination is properly noted Record dimensions of replacement pitot tubes

5.4 INSTALLATION OF PITOT TUBE MOUNTING ASSEMBLY

The following steps will be taken to properly install the pitot tube mounting assembly

- The matrixed RPT will observe the pitot tube installation to ensure pitot tube's nozzle opening is directed into the duct airflow Extreme care must be exercised when the pitot tube mounting assembly is installed into the exhaust duct Any damage to the pitot tube, such as bending or kinking, will necessitate replacement

- Maintenance personnel will slowly install the pitot tube assembly into the exhaust duct using care to avoid damage to the pitot tube.

- Reattach and tighten the nuts that hold the pitot tube mounting assembly to the exhaust duct Do not overtighten

- The contamination control RPT must check the hands of the Maintenance personnel for possible radioactive contamination

- Maintenance personnel will change surgeon's gloves as necessary

- The contamination control RPT will smear check the immediate area surrounding the pitot tube for possible contamination

- The matrixed RPT will remove the contamination control cell.

- Place the contamination control cell into a plastic bag

- Decontaminate as required the immediate area surrounding the pitot tube to acceptable levels

- Place any other trash generated during the pitot tube inspection and/or replacement into the plastic bag.

- Tape the plastic bag shut with yellow tape

- Place the replaced pitot tube into the appropriate waste drum for nonline generated metal for the building location.

- Place the bag of trash collected during the inspection into the appropriate drum for nonline generated waste for the building location

- The contamination control RPT must check all personnel with the Ludlum instrument for possible contamination

- Follow the existing H&S procedures if contamination is found

- Proceed to the next effluent sampling location

- Repeat the steps from donning surgeon's gloves through proceeding to the next effluent sampling location, until all pitot tube inspections on the schedule have been completed

5.5 EFFLUENT RELEASE POINT PARAMETERS

Attachment 6 6A lists the PSZ effluent release point parameters Attachment 6 6B lists the non-PSZ effluent release point parameters

6 0 DOCUMENTATION

After all scheduled pitot tubes have been inspected and/or replaced, copy and deliver the original Pitot Tube Inspection and Replacement Log to the EMAD Program Manager. Place a copy of the log in the RPT file cabinet

ATTACHMENT 6.6A

EFFLUENT RELEASE POINT PARAMETERS (PSZ)

	SAMPLER LOCATION	NUMBER OF PITOT TUBES	DUCT DIM	DUCT VEL. (HORIZ/VERT)	DUCT AREA(SF)	PITOT TUBE DIAM (")
1	707-101	2	14"DIA	HORIZ	1 07	0 625
2	707-102	2	24"DIA	VERT	3 14	0 500
3	707-105	3	36"X36"	VERT	9 00	0 875
4	707-106	2	22"X22"	HORIZ	3 36	0 750
5	707-107	3	28"X28"	HORIZ	5 44	0.625
6	707-108	3	30"X30"	HORIZ	6.25	0 750
7	707-R21	2	16 5"X56 5"	HORIZ	6 47	0 500
8	707-R22	2	16 5"X56 5"	HORIZ	6 47	0 375
9	707-R23	2	16 5"X56 5"	HORIZ	6 47	0 500
10	707-R24	2	16 5"X56 5"	HORIZ	6 47	0.375
11	707-R25	2	16 5"X56 5"	HORIZ	6 47	0 375
12	707-R26	2	16 5"X56 5"	HORIZ	6 47	0 500
13	707-R27	2	16 5"X56 5"	HORIZ	6 47	0 500
14	707-R45	2	12 5"X44 5"	HORIZ	3 86	0 750
15	707-R46	2	12 5"X44 5"	HORIZ	3 86	0 750
16	779-782	3	36"X57"	HORIZ	14 25	0 500
17	779-729	2	36"X30"	HORIZ	7 50	0 500
18	776-201	2	14"DIA	HORIZ	1 07	0 625
19	776-202	3	20"X28"	VERT	3 89	0 500
20	776-204	3	72"X24"	HORIZ	12 00	0 625
21	776-205	2	30"X30"	HORIZ	6 25	0 625
22	776-206	2	32"X30"	HORIZ	6 67	0 625
23	776-207	2	42"DIA	HORIZ	9 62	0 500
24	776-250	5	194"X63"	HORIZ	84 88	0 500
25	776-251	3	60"X32"	HORIZ	13 33	0 500
26	776-252	2	36"X22"	HORIZ	5 50	0 750
27	559-561	3	36"X57"	HORIZ	14 25	0 500
28	776-LDY	2	48"DIA	VERT	12 57	0 500
29	771-MAI	3	8'X10'	HORIZ	80 00	0 250
30	771-CMA	2	24"DIA	VERT	3 14	0 375
31	771-CRM	2	33"X20"	HORIZ	4 58	0 375
32	774-202	2	16"X20"	VERT	2 22	0 375
33	991-985	3	26"X20"	HORIZ	3 61	0 375
34	374-MAI	3	40"DIA	HORIZ	8 73	0 375
35	991-MAI	3	60"X54"	HORIZ	22 50	0 750
36	371-N01	3	48"DIA	VERT	12 57	0 375
37	371-N02	3	48"DIA	VERT	12 57	0 375
38	371-SSS	3	72"DIA	VERT	28 27	1 000
39	374-SPD	3	19"DIA.	VERT	1 97	0 500

ATTACHMENT 6.6B

EFFLUENT RELEASE POINT PARAMETERS (NON-PSZ)

	SAMPLER LOCATION	NUMBER OF PITOT TUBES	DUCT DIM	DUCT VEL. (HORIZ/VERT)	DUCT AREA(SF)	PITOT DIAM (")
1	444-MAI	3	8'X8'	HORIZ	64 00	0 500
2	444-D05	1	24"X30"	HORIZ	5 00	0 500
3	447-MAI	3	6'X5'	HORIZ	30 00	0 625
4	865-EEE	3	60"X44"	HORIZ	18 33	0 625
5	865-WWW	3	56"X56"	HORIZ	21 78	0 625
6	886-875	3	24"X24"	HORIZ	4 00	0 375
7	881-MA1	3	60"DIA	HORIZ	19 63	0 625
8	881-MA2	3	60"DIA	HORIZ	19 63	0 625
9	881-MA3	3	60"DIA	HORIZ	19 63	0 625
10	881-MA4	3	60"DIA	HORIZ	19 63	0 625
11	883-AAA	3	6'X8'	HORIZ	48 00	0 500
12	883-BBB	3	52"X98"	HORIZ	35 39	0 500
13	883-CCC	3	3'X4'	HORIZ	12 00	0 500
14	889-MAI	1	30"DIA	VERT	4 90	0 500

TITLE
EFFLUENT AIR SAMPLE
DATA REDUCTION

Approved By

1.0 TABLE OF CONTENTS

2.0 PURPOSE AND SCOPE

This procedure establishes the requirements for data reduction to provide permanent record of effluent air emissions and generate reports for effluent air sampling locations

This procedure applies to requirements for data reduction to provide record of effluent air emissions from effluent exhaust systems venting to the atmosphere and addresses (1) reporting periods, (2) sample composite schedules, (3) data base input, and (4) report generation

3.0 RESPONSIBILITIES AND QUALIFICATIONS

The Environmental Monitoring and Assessment Division (EMAD) is responsible for the following tasks

- Prepare Plutonium and Uranium Monthly Cut-Off Letter
- Prepare the Plutonium and Uranium Monthly Composite Schedules
- Enter the Eastech Volumes for each sampler location
- Perform electronic transfer data from the 123 H&S Laboratory data base
- Enter laboratory analyses for each analyte
- Calculate the release value for each location and analyte
- Prepare effluent emissions portion of the Monthly Environmental Monitoring Report

3.1 PREREQUISITES

Personnel performing the work described in this procedure shall have received prior training in the use of computerized spreadsheet applications

Effluent air from exhaust plenums is sampled during its release to the atmosphere Samples of effluent air are collected at a point downstream from the final stage of HEPA filters

4 0 REFERENCES

4.1 SOURCE REFERENCES

4.2 INTERNAL REFERENCES

5 0 PROCEDURES

5.1 REPORTING PERIOD

The following steps must be taken during the reporting period

- At the beginning of each month, determine the sample cut-off date for the next reporting period
- Obtain a calendar that includes the current and the next month
- Locate the last Tuesday for the next month on the calendar This is the date for the state exchange meeting.
- Locate the Friday before the last Tuesday of the next month on the calendar This

is the date for the prestate meeting All emission data must be reduced and reports prepared prior to this meeting

- Allow one additional week for data reduction, consider holidays and vacations in the allowance

- Select the Monday or Thursday of the additional week for the Plutonium particulate filter collection cut-off date. Plutonium particulate filters are collected on Monday and Thursday per the Effluent Air Radioparticulate Sample Collection procedure

- Select the Tuesday or Friday of the additional week for the Uranium particulate filter collection cut-off date. Uranium particulate filters are collected on Tuesday and Friday per the Effluent Air Radioparticulate Sample Collection procedure

- Write an Interoffice Correspondence to the 123 H&S Laboratory Manager specifying the cut-off date for both Plutonium and Uranium particulate filter collection, and the date the lab analytical data is required Analyses for Americium and Beryllium are also provided from the particulate filters collected for the Plutonium and Uranium sampling location

- The cut off-date for tritium samples is the last Monday, Wednesday, or Friday of the next month Tritium samples are collected on Monday, Wednesday, and Friday per the Effluent Tritium Sample Collection procedure

5.2 PLUTONIUM AND URANIUM MONTHLY COMPOSITE SCHEDULES

Take the steps below to properly prepare the Plutonium and Uranium Monthly Composite Schedules

- By the first of each month, collect the Effluent Travel and Chain of Custody Sheets and the Tritium Travel and Chain of Custody Sheets from the 123 H&S Laboratory Receiving Station The Effluent Travel and Chain of Custody Sheets were left in the Receiving Station with the particulate filter samples after sample collection.

- Sort the Effluent Travel and Chain of Custody Sheets by date in ascending order

- Start up the Macintosh computer that contains the Effluent Air data base

- Double click on the "hard drive" icon to open the hard drive menu

- Double click on the "Microsoft Excel" icon to open the Microsoft Excel menu

- Double click on the "Effluent Data" folder icon to open the Effluent Data folder menu

- Double click on the "last month's file" icon to open the last month's file

- From the command line select "file" and drag to the "save as" command

- Enter the name of the new file in the appropriate box and click on "save " A copy of the last month's spreadsheet will be saved, providing a template for the new month's data. The name of the new file shall include the first three letters of the month, followed by DAT, and the last two letters of the year Example JANDAT91

- Go to the Plutonium Effluent Composite Schedule which begins at cell number AZ1

- Go to column BF.
- Determine the On date (cell BF4) which corresponds to the plutonium date off for the current calendar month and input that date
- Determine the dates which correspond to all of the Mondays or Thursdays for the next sampling period.
- Enter these dates for the Off date for the remainder of cells BH5 through BX5 until all the Off dates for sampling period have been entered.
- Obtain the Effluent Travel and Chain of Custody Sheets with the date On and date Off that corresponds to the date On and date Off in cells BF4 and BF5 of the spreadsheet.
- Match the LOC'N in column BA to the location on the Effluent Travel and Chain of Custody Sheet
- Locate the Number Collected column on the Effluent Travel and Chain of Custody Sheet that corresponds to the matched location
- Enter the number of particulate filters collected in column BF that corresponds to the location on the Effluent Travel and Chain of Custody Sheet
- Repeat the steps from determining the On date through entering the number of particulate filters, until the number of particulate filters collected have been entered for On and Off sampling period
- Go to cell BD7 (SPL. VOL. column) for the first sampler location

- Observe the formula bar

- Verify that the formula =81.5*BB7*BA4 is displayed This formula calculates the Sample Volume by multiplying 81.5 times the number of filters times the number of days in the sampling period

- Check the last On and Off sample collection period for each location to verify that samples were collected for that period

- If the samples for a location are missing for the last period, check the previous sampling periods until the last sample collection is located

- Count the number of days that the particulate filter were not collected

- Go to the Sample Volume cell location for the location which samples were not collected on the last collection date

- Adjust the formula to subtract the number of days that the particulate filters were not collected. Example the 707-101 samples were not collected for the last two sampling periods which is equal to seven days The formula 81.5*BB7*BA4 should be edited to 81.5*BB7*(BA4-7) This adjusts the Sample Volume by subtracting the seven days the particulate filters were not collected

- Obtain from the files the hard copy printout of the previous month's Plutonium Composite Schedule

- Check the last On and Off sample collection period for each location to verify that samples were collected for that period

- If the samples for a location are missing for the last period, check the previous sampling periods until the last sample collection is located

- Count the number of days that the particulate filters were not collected

- Go to the Sample Volume cell location on the new spreadsheet for the location which samples were not collected on the last collection date.

- Adjust the formula to add the number of days that the particulate filters were not collected Example the 707-102 samples were not collected for the last three sampling periods which is equal to 10 days. The formula 81 5*BB8*BA4 should be edited to 81.5*BB8*(BA4+10) This adjusts the Sample Volume by adding the 10 days the particulate filters were not collected during the last sampling month

- Repeat the steps from observing the formula bar through adjusting the formula to subtract the number of days the particulate filters were not collected, for each sampler location until the Sample Volume is properly adjusted

- Go to cell BA64, the start of the Uranium Monthly Composite Schedule

- Repeat the steps from determining the On date through obtaining from the files the hard copy printout of the previous month's composite schedule, until all of the Uranium sample collection data are entered and all formulas are adjusted Keep in mind that the Uranium dates are for Tuesdays and Fridays

- Print the composite schedules

- Mail or fax the composite schedules by the first of each month, to the 123 H&S Laboratory Receiving Station.

5.3 EFFLUENT VOLUME CALCUALTION

Take the steps below to properly calculate the effluent volume

- Go to cell CB1 the start of the Eastech Totalizer Readings
- Change the dates in cells CB5 through CB14 and CB28 through CB37 to reflect the Plutonium On and Off dates for the sampling month
- Change the dates in cells CB48 through CB57 to reflect the Uranium On and Off dates for the sampling month
- Change the number of DAYS in the cells CC5 through CC14 and CC28 through CC37 to reflect the number of days between the On and Off dates for each sampling period
- Change the number of DAYS in the cells CC48 through CC57 to reflect the number of days between the On and Off dates for the sampling period
- Obtain the Effluent Travel and Chain of Custody Sheets
- Go to cell CD5
- Locate the Effluent Travel and Chain of Custody Sheet that corresponds to the dates in cell CB5

- Match the sampler locations for cells CD2 through DG2 to the corresponding sampler locations on the Effluent Travel and Chain of Custody Sheets

- Enter the Effluent Volume found on the Effluent Travel and Chain of Custody Sheets in the appropriate cell for each sample location, leaving blank any sampler locations where the samples are missing.

- Repeat the steps from locating the Effluent Travel and Chain of Custody Sheet through entering the Effluent Volume for each of the cells CB5 through CB14 until the Effluent Volumes for each sampler location and for each sampling period have been entered. The spreadsheet calculates the effluent volume and places the effluent volume throughout the spreadsheet in the appropriate cells

5 4 TRITIUM DATA ENTRY

Follow the steps below to properly perform the tritium data entry

- Obtain the Effluent Water Liquid Scintillation Tritium Report from the 123 H&S Laboratory.

- Obtain the Tritium Travel and Chain of Custody Sheets

- Go to Cell CB69, the beginning of the Tritium Effluent Summary

- Obtain the calendar for the sampling month

- Determine the dates which correspond to all of the Mondays, Wednesdays, and Fridays for the sampling month Tritium samples are collected on these days per the Effluent Tritium Sample Collection procedure

- Enter these dates for the On and Off date for the cells CB76 through BR89 until all the Off dates for sampling month have been entered

- Change the number of DAYS in cells CC76 through CC89 to reflect the number of days between the On and Off dates for each sampling period

- Match the sampler locations for cells CD73 through CN73 to the corresponding sampler locations on the Effluent Water Liquid Scintillation Tritium Report

- Enter the Results found on the Effluent Water Liquid Scintillation Tritium Report in the appropriate cell for each sampler location for each of the On and Off dates, leaving blank any sampler locations where the samples are missing.

- The spreadsheet calculates the tritium volumes and release data places the tritium data in the summary beginning at cell AA2.

- Go to cell AH16.

- Copy cell AH16

- Go to AJ6

- Locate the month for the current sampling period.

- Go to the cell in Column AL that is on the same line as the current sampling month.

- Paste the tritium value from cell AH16

- Go to cell AF15 This cell contains the maximum tritium value for the sampling month

- Copy cell AF15.

- Go to the cell in column AN that is on the same line as the current sampling month.

- Paste the maximum tritium value from cell AF15

- Locate on the Effluent Water Liquid Scintillation Tritium Report the maximum tritium value for the sampling month

- Type the error factor associated with the maximum value into the same cell used for the maximum tritium value The spreadsheet calculates the release value for the year and places the value in cell AL80

5.5 ELECTRONIC TRANSFER FROM THE 123 H&S LABORATORY DATA BASE

Follow the steps below to electronically transfer data from the 123 H&S Laboratory data base

- From the hard drive menu, double click on the "VersaTerm" icon

- Make connection to the Rocky Flats vax computer

- Type "stack" to the access the stack directory

- From the $ prompt, copy the plutonium, uranium and americium data from the 123 H&S Laboratory data base

- Type "copy gem1 [brent prestate] and the corresponding file name that is to be copied. For plutonium data type spurpt.lis, uranium type surpt.lis, and for americium type samrpt.lis Example for plutonium data type copy gem1 [brent prestate]spurpt.lis *.

- Select the "File" command and drag to "text Kermit" to select the Kermit commands.

- Send the plutonium, uranium, and americium files from the vax to the desktop computer

- At the Kermit prompt, type "send spurpt.lis" return

- Select the "File" command and drag to "send file" command A box will open and the destination files will have to be selected

- Double click on drive, folder, and file names to select the destination for the file transfer These should be Hard drive, Microsoft Excel, and the file name

- Click on the cancel box.

- Select the "File" command and drag to "receive file " The file will now transfer to the desktop computer as a text file

- Repeat the steps renaming the files that are being sent and received until all three files have been transferred.

- At the Kermit prompt type "quit "

- At the $ prompt type "logoff"
- Select the "File" command and drag to "quit" command. You should be at the hard drive menu

5.6 PARCE TRANSFERRED TEXT FILES

Follow the steps below to save the transferred files in a "parce" format

- From the hard drive menu, double click on the "Microsoft Excel" icon
- Locate the text files that were transferred from the vax.
- Select one file by double clicking on the file icon It is recommended that the uranium file be opened first
- Go to the first cell in column A that contains sample values
- Click and drag down column A until all of the sample values have been selected
- Select the "Data" command and drag to the "parce" command
- When the box appears, click on the "guess" box.
- Click on the "ok" box. The data will now be split into columns and cells to facilitate data entry
- Save the parced data file

- Repeat the steps until all three files have been data parced

5.7 PLUTONIUM, URANIUM, AND AMERICIUM DATA ENTRY

To perform Plutonium, Uranium and Americium data entry, follow the steps below:

- From the hard drive menu, double click on the "Microsoft Excel" icon
- Locate the data spreadsheet for the current month and open by double clicking on the file icon
- Go to cell A6.
- Select cells A6 through Y59 by clicking on A6 and dragging to Y59
- Select the "Data" command and drag to the "sort" command
- When the box appears, change the highlighted cell location from A6 to B6
- Click on the "ok" box. The data selected in cells A6 through Y59 will now be sorted by sampler location in ascending order
- Select the "File" command and drag to the "open" command
- When the box appears, locate and select the uranium data file that was transferred to the desktop computer and parsed.
- Click on the "open" box.

- Go to the first sample number in column A.
- Select all the cells in column A that contain sample numbers by clicking on the first cell location that contains data and dragging to the last cell that contains data in column A.
- Select the "Edit" command and drag to the "copy" command
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the current spreadsheet
- Go to cell C6
- Select the "Edit" command and drag to the "paste" command The sample numbers for each sampler location should now be entered
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the parced uranium data
- Go to the first U233+4 value in column G
- Select all the cells in column G that contain U233+4 values by clicking on the first cell location that contains data and dragging to the last cell that contains data in column G
- Select the "Edit" command and drag to the "copy" command
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the current spreadsheet

- Go to cell L6
- Select the "Edit" command and drag to the "paste" command The U233+4 values for each sampler location should now be entered.
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the parced uranium data
- Go to the first U238 value in column I
- Select all the cells in column I that contain U238 values by clicking on the first cell location that contains data and dragging to the last cell that contains data in column I
- Select the "Edit" command and drag to the "copy" command
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the current spreadsheet
- Go to cell F6.
- Select the "Edit" command and drag to the "paste" command The U238 values for each sampler location should now be entered
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the parced uranium data.
- Select the "File" command and drag to the "close" command The current spreadsheet should now appear

- Select the "File" command and drag to the "open" command
- When the box appears, locate and select the plutonium data file that was transferred to the desktop computer and parsed
- Click on the "open" box.
- Go to the first Pu238 value in column G
- Select all the cells in column G that contain Pu238 values by clicking on the first cell location that contains data and dragging to the last cell that contains data in column G
- Select the "Edit" command and drag to the "copy" command
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the current spreadsheet
- Go to cell F6
- Select the "Edit" command and drag to the "paste" command The Pu238 values for each sampler location should now be entered
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the parced plutonium data.
- Go to the first Pu239 value in column I.
- Select all the cells in column I that contain Pu239 values by clicking on the first

cell location that contains data and dragging to the last cell that contains data in column I

- Select the "Edit" command and drag to the "copy" command
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the current spreadsheet
- Go to cell H6
- Select the "Edit" command and drag to the "paste" command The Pu239 values for each sampler location should now be entered
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the parced plutonium data
- Select the "File" command and drag to the "close" command The current spreadsheet should now appear
- Select cells A6 through Y59 by clicking on A6 and dragging to Y59
- Select the "Data" command and drag to the "sort" command.
- When the box appears, verify that the highlighted cell location reads A6
- If the highlighted cell does not read A6 edit to read A6
- Click on the "ok" box. The data selected in cells A6 through Y59 will now be sorted by to the original order

- Select the "File" command and drag to the "save" command
- Select the "File" command and drag to the "close" command
- Select the "File" command and drag to the "open" command
- When the box appears, select and open the previous month's spreadsheet by double clicking on the spreadsheet title The americium data are reported a month in arrears to the plutonium and uranium data
- Select the "File" command and drag to the "open" command
- When the box appears, select and open the parced americium data file by double clicking on the file title
- Go to the first Am241 value in column G
- Select all the cells in column G that contain Am241 values by clicking on the first cell location that contain data and dragging to the last cell that contains data in column G
- Select the "Edit" command and drag to the "copy" command
- Select the "Windows" command and drag to the "unhide" command that contains the file name of the spreadsheet for the previous month
- Go to cell J6
- Select the "Edit" command and drag to the "paste" command The Am241 values

for each sampler location should now be entered

- Select the "Windows" command and drag to the "unhide" command that contains the file name of the parced americium data

- Select the "File" command and drag to the "close" command The previous month's spreadsheet should now appear

5.8 PREPARATION OF THE AMERICIUM RELEASE REPORT

Follow the steps below to prepare the Americium Release Report

- Go to cell K61

- Copy cell K61.

- Go to cell AJ90. This is the start of the Americium Release Report

- Locate the month for the current sampling period

- Go to the cell in Column AL that is on the same line as the current sampling month

- Paste the americium value from cell K61.

- Go to cell K63 This cell contain the maximum concentrated americium value for the sampling month.

- Locate the sampler location that corresponds to the maximum concentrated

americium value by searching the data in cells U6 through U54

- Obtain the hard copy printout of the parced americium data
- Locate the sampler location that corresponds to the maximum concentrated value on the hard copy printout of the parced americium data
- Locate the americium value and the error factor the sampler location
- Obtain a calculator
- Move the decimal point three places to the left for the americium value while entering the value into the calculator Example, the americium value reads 0 067 enter as 0.000067
- Divide the americium value by 7
- Go to cell AN96
- Locate the month for the current sampling period
- Enter the results of the calculation performed above, where the americium value was divided by 7, in the first portion of the cell
- Move the decimal point three places to the left for the americium error value while entering the value into the calculator Example, the americium error value reads 0 026 enter as 0 000026
- Divide the americium error value by 7

- Go to cell AN96
- Locate the month for the current sampling period
- Enter the results of the calculation performed above, where the americium error value was divided by 7, in the second portion of the cell The spreadsheet totals the release for the year
- Print the Americium Release Report
- Select the "File" command and drag to the "save" command
- Select the "File" command and drag to the "close" command

5 9 PREPARATION OF THE PLUTONIUM AND URANIUM RELEASE REPORTS

Follow the steps below to prepare the Plutonium and Uranium Release Reports

- From the hard drive menu, double click on the "Microsoft Excel" icon
- Locate the data spreadsheet for the current month and open by double clicking on the file icon.
- Go to cell G61
- Copy cell G61. This is the release value for the Pu238
- Go to cell AJ2. This is the start of the Plutonium Release Report

- Locate the month for the current sampling period
- Go to the cell in Column AL that is on the same line as the current sampling month.
- Paste the plutonium Pu238 value from cell G61
- Go to cell G63 This cell contains the maximum concentrated plutonium Pu238 value for the sampling month
- Locate the sampler location that corresponds to the maximum concentrated americium value by searching the data in cells S6 through S54
- Obtain the hardcopy printout of the parced plutonium data
- Locate the sampler location that corresponds to the maximum concentrated Pu238 value on the hard copy printout of the parced americium data
- Locate the plutonium Pu238 value and the error factor for the sampler location
- Obtain a calculator
- Move the decimal point three places to the left for the plutonium Pu238 value while entering the value into the calculator Example, the plutonium Pu238 value reads 0 067 enter as 0 000067
- Divide the plutonium Pu238 value by 7
- Go to cell AN96

- Locate the month for the current sampling period
- Enter the results of the calculation performed above, where the plutonium Pu238 value was divided by 7, in the first portion of the cell
- Move the decimal point three places to the left for the plutonium Pu238 error value while entering the value into the calculator Example, the plutonium Pu238 error value reads 0 026 enter as 0 000026
- Divide the plutonium Pu238 error value by 7
- Go to cell AN9
- Locate the month for the current sampling period
- Enter the results of the calculation performed above, where the plutonium Pu238 error value was divided by 7, in the second portion of the cell The spreadsheet totals the release for the year
- Repeat the steps from going to cell G61 through entering the results of the calculation above by substituting the appropriate cell locations for Pu239, U233+4, and U238
- Print the Plutonium and Uranium Release Reports

5.10 BERYLLIUM DATA ENTRY

Take the steps below to properly complete the Beryllium data entry

- Obtain beryllium sample analyses from the 881 General Laboratory
- Go to cell A6
- Select cells A6 through Y59 by clicking on A6 and dragging to Y59
- Select the "Data" command and drag to the "sort" command
- When the box appears, change the highlighted cell location from A6 to C6
- Click on the "ok" box. The data selected above, cells A6 through Y59, will now be sorted by sample identification number in ascending order
- Go to cell Q6
- Enter the beryllium data for each sample identification number in cells Q6 through Q54
- Go to cell A6.
- Select cells A6 through Y59 by clicking on A6 and dragging to Y59
- When the box appears, change the highlighted cell location to A6 if necessary
- Click on the "ok" box. The data selected above, cells A6 through Y59, will now be sorted to their original order
- Go to cell AG32. This cell contains the beryllium release data for the current sampling month.

- Copy cell AG32.
- Go to cell AQ66
- Locate the month for the current sampling period
- Paste the beryllium release data from cell AG32
- Go to cell AG33 This cell contains the maximum concentrated beryllium value for the sampling month
- Copy cell AG33
- Go to the cell in column AH that is on the same line as the current sampling month.
- Paste the maximum concentrated beryllium value from cell AG33
- The spreadsheet calculates the total release for the year in cell AQ80
- Print the Beryllium Report

5.11 SAMPLING LOCATIONS

Attachment 6 7A shows the PSZ sampling locations Attachment 6.7B shows the non-PSZ sampling locations

6.0 DOCUMENTATION

Obtain the printed reports for plutonium, uranium, americium, tritium, and beryllium These reports will be used as permanent records of effluent air emissions for effluent air sampling locations Add footnotes as appropriate to provide additional information that may affect the release values for the sampling month. Information may include missing analyses due to the failure of the laboratory quality assurance criteria or reruns due to analytical problems etc

Attachment 6.7A. PSZ Sampling locations

Exhaust System ID	n	Collection Frequency	Analytical Frequency					
		FPS	H-3	TLL-a	H-3	Pu	Am	UBe
371-N01	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
371-N02	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
371-SSS	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
374-MAI	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
374-SPD	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
559-561	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-101	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-102	2	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
707-105	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-106	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-107	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-108	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R21	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R22	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R23	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R24	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R25	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R26	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R27	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R45	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
707-R46	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
771-CMA	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
771-CRM	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
771-MAI	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
774-202	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-201	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-202	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-204	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-205	2	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-206	2	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-207	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
776-250	5	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-251	3	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
776-252	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
778-LDY	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
779-729	2	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
779-782	3	MoTh	MWF	MoTh	MWF	(MC)	(MC)	(MC)(MC)
991-985	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)
991-MAI	3	MoTh	-	MoTh	-	(MC)	(MC)	(MC)(MC)

MC = Monthly Composite

Attachment 6 7B non-PSZ Sampling locations

Exhaust System ID	Collection Frequency n	FPS	Analytical Frequency H-3	TLL-a	H-3	Pu	Am	U	Be
444-D05	1	TuFr	-	TuFr	-	-	-		(MC)(MC)
444-MAI	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
447-MA	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
865-EEE	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
865-WWW	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
881-MA	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
881-MA2	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
881-MA3	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
881-MA4	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
883-AAA	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
883-BBB	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
883-CCC	3	TuFr	-	TuFr	-	-	-		(MC)(MC)
886-875	3	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)
889-MA	1	TuFr	-	TuFr	-	(MC)	(MC)		(MC)(MC)

MC = Monthly Composite

TITLE
PREVENTIVE MAINTENANCE
PROCEDURE FOR RFP TSP
HIVOL AIR SAMPLER

Approved By

1.0 TABLE OF CONTENTS

2.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) establishes the preventive maintenance requirements and procedures on a routine basis for the Rocky Flats Plant (RFP) Environmental Monitoring and Assessment Total Suspended Particulate (TSP) air sampler. This procedure is intended to reduce downtime, equipment failure, and enhance the operational readiness of the RFP Environmental Monitoring and Assessment Division (EMAD) Air Monitoring Program

This procedure outlines specific requirements and steps required to maintain the routine preventive maintenance for the RFP TSP air samplers Included in this procedure are detailed instructions to perform routine inspections, assembly replacement, troubleshooting and repair, requirements for recalibration, permit requirements, potential hazards and safety precautions, and required tools and equipment

3 0 RESPONSIBILITIES AND QUALIFICATIONS

3.1 INSPECTIONS

Visual inspections of air sampler operation and physical condition are to be performed by qualified Radiological Protection Technicians (RPT) and/or qualified Electrician Technicians This inspection procedure is to be performed at scheduled intervals

3.2 PERMIT REQUIREMENTS

An approved Radiological/Health & Safety Work Permit, RF - 13010, is required prior to any maintenance being performed that would create an interruption to normal operation of an environmental sampler. This requirement is in compliance with the RFP Health and Safety Manual H & S 6 05, section 5 9, page 5 of 16 If an environmental sampler is inoperative and is requiring maintenance, a work permit will not be required to perform maintenance

4.0 REFERENCES

4.1 SOURCE REFERENCES

4.2 INTERNAL REFERENCES

5.0 PROCEDURES

5 1 POTENTIAL HAZARDS AND SAFETY PRECAUTIONS

To prevent injury, the air sampler must be de-energized prior to performing any maintenance or parts replacement on air sampler

5.2 REQUIREMENTS FOR RECALIBRATION

Calibration for the TSP air samplers is performed at 3-month intervals If any of the following conditions occur, recalibration of the air sampler is required

- Blower motor has been repaired or replaced
- Critical orifice has been repaired or replaced
- Air sampler received physical damage, for example hit by vehicle, gun shot, vandalism, etc EMAD air sampler Program Manager may evaluate extent of damage to determine if recalibration will be required after repairs are completed, on a case-by-case basis.

5.3 PREVENTIVE MAINTENANCE

Due to the design of the TSP high volume air sampler, preventive maintenance is limited to the blower motor assembly When an air sampler is operated on a continual basis, the blower motor assembly will be replaced at 14-day intervals.

5.3.1 Blower Motor Assembly Replacement Procedure

This procedure should only be performed by qualified personnel. Potentially lethal voltage may be exposed Use caution while performing the following procedure

One person can replace the blower motor assembly and no tools are required. The only material necessary is the replacement blower motor assembly, W & A part number 504. This procedure does require a RFP Radiological/Health & Safety Work Permit (RF-13010).

As a safety precaution, the air sampler must be de-energized and disconnected from its power source

To remove and replace the blower motor assembly, follow the steps below

- Turn air sampler off, and disconnect sampler from power source
- Turn air sampler on to make certain the unit is de-energized. If sampler starts operating, do not proceed.
- Unplug blower motor power cord from timer unit
- Unlatch and swing out the critical flow device See Figure 6 12-1

- Remove the four plastic-pronged knobs
- Slide out blower motor assembly See Figure 6 12-2.
- Slide in replacement blower motor assembly
- Replace the four plastic-pronged knobs securely.
- Swing back and re-latch the critical flow device See Figure 6 12-3
- Connect blower motor power cord back in to timer unit
- Connect power source to air sampler and turn sampler on

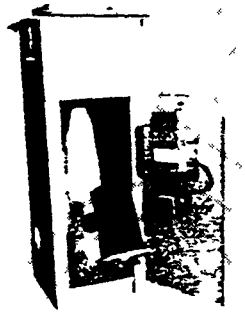

Figure 6 12-1

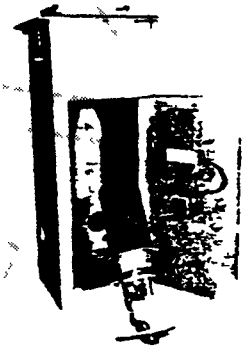

Figure 6 12-2

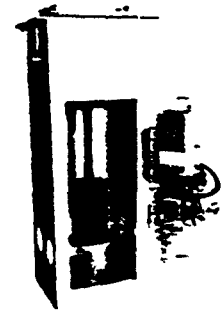

Figure 6 12-3

6.0 DOCUMENTATION

Reporting results of air sampler inspections are to be documented using RFP Form RFP/EMAD-TSP-01 (Form 6 12A) Completed reports of inspections are to be submitted to the EMAD Air Monitoring Program Manager

U.S. DEPARTMENT OF ENERGY ROCKY FLATS PLANT FORM 6.12A

RFP TSP HIVOL Air Sampler Inspection Report

DATE_____ AIR SAMPLER NO _____

INSPECTION PERFORMED BY_____

INSPECTION CHECK LIST

1 OUTSIDE CONDITION OF UNIT. GOOD_____ DAMAGED_____
COMMENTS _____
_____

2. BLOWER MOTOR RUNNING SMOOTHLY YES_____ NO_____
COMMENTS _____

3 HOUR METER READING. _____

4 CONDITION OF SAMPLER FILTER OK_____ NOT OK_____
COMMENTS _____

5 CONDITION OF FILTER GASKET OK_____ NOT OK_____
COMMENTS: _____

6 CONDITION OF BLOWER MOTOR KNOBS TIGHT_____ LOOSE_____
COMMENTS _____

RADIOLOGICAL/HEALTH & SAFETY WORK PERMIT

Instructions and requirements for the use of this form are contained in H&S 6 05 Radiological/H&S Work Permit

SECTION I - JOB INFORMATION (To be completed by job supervisor or permit initiator)

Job Name _____ Auth or WO # _____

Bldg _____ Room # _____ Date _____ From _____ (AM/PM) To _____(AM/PM)

Scope of Work _____

_____

SECTION II - DESCRIPTION OF HAZARDS (To be completed by responsible user)

MATERIAL HAZARDS

____ HNO_3 (Nitric Acid)
____ HCl (Hydrochloric Acid)
____ H_2SO_4 (Sulfuric Acid)
____ HF (Hydrofluoric Acid)
____ Caustic
____ Flammables
____ Trichloroethylene
____ Beryllium
____ Plutonium
____ Uranium
____ Asbestos

ELECTRICAL HAZARDS

Energized System?
____ Yes ____ No
____ 120V
____ 220V
____ 480V
____ 600V
____ Above 600V
_____ V
Involved?
lved?

HIGH TEMP/HIGH PRESSURE

____ Vacuum
____ Ambient Pressure
____ <15 psig
____ >15 psig
_____ psig
____ Below Ambient Temp
_____ °F
____ Ambient Temp
____ Above Ambient Temp
_____ °F
____ Steam System
____ Hydraulic System

Fire Suppression Interruption? ____ Yes ____ No

Other hazards and precautions _____

SECTION III - RADIOLOGICAL AND NONRADIOLOGICAL SAFETY REQUIREMENTS (To be completed by Radiology, Protection, and/or H&S Area Engineer)

JSA REQUIRED _____Yes _____No
JOBSITE REVIEW REQUIRED _____Yes _____No
A PACKAGE REQUIRED _____Yes _____No
RADIOLOGICAL PROTECTION TECHNOLOGIST (RPT) REQUIRED ___ YES ___ NO

PROTECTIVE APPAREL

____ Coveralls
____ Tyvek Suit
____ Plastic Suit
____ Acid Suit
____ Surgeon s Gloves
____ Plastic Gloves
____ Rubber Gloves
____ Leather Gloves
____ Cloth Cap
____ Cloth Hood
____ Plastic Hood
____ Booties
____ Plastic Booties
____ Rubber Boots
____ Safety Glasses
____ Goggles
____ Face Shield
____ Hard Hat
____ Hearing Protection
____ Taped Openings
____ Other _____

CONTAMINATION CONTROL VENTILATION REQUIREMENTS

____ Containment Pen
____ Plastic House
____ SBA House
____ Plastic Sleeve
____ Glove Bag
____ Air Mover
____ Down Draft
____ GB Exhaust
____ Other _____

RESPIRATORY REQUIREMENTS

____ Half Mask
____ Full Face
____ Supplied Breathing Air
____ SCBA
____ Chemical Canister

RADIOLOGICAL PROTECTION REQUIREMENTS

____ Start of job
____ On call
____ Full time

DOSIMETRY REQUIREMENTS

____ TLD Dosimeter
____ Extremity Dosimeter
____ Special Dosimeter

ELECTRICAL PROTECTION REQUIREMENTS

(Consult Job Supervisor)
____ Insulating Mat
____ Insulating Blanket
____ Cover up
____ High Voltage Sleeves
____ High Voltage Gloves
_____ Class I
_____ Class II
____ Hot Sticks
____ TIC Tracer
____ Insulated Bucket Truck
____ Grounding Cable
____ Grounding Stick

RADIOLOGICAL PROTECTION PRE-JOB SURVEY

Contamination levels and extent _____

_____

Gamma _____
Neutron _____
Limitations _____

_____

RPT Signature

RADIOLOGICAL PROTECTION POST-JOB SURVEY

Contamination levels and extent _____

_____

Gamma _____
Neutron _____

_____

RPT Signature

Other Special Requirements _____

_____

_____

_____

RADIOLOGICAL/HEALTH & SAFETY WORK PERMIT - CONTINUED

Auth or WO # _____ Date _____

SECTION IV - PREPARATION FOR THE JOB (To be completed by the responsible user and job supervisor)

The area or equipment is ready to be worked on and is in safe condition	___ Yes
The necessary systems have been shutdown drained blanked etc	___ Yes ___ N/A
The necessary systems have been locked out/tagged out. #_____	___ Yes ___ N/A
Voltage checked after lock out	___ Yes ___ N/A
Utilities has been notified of upcoming work and is prepared	___ Yes ___ N/A
The Fire Department has been notified of upcoming work and is prepared	___ Yes ___ N/A

SECTION V - APPROVAL SIGNATURES

THE ABOVE REQUIREMENTS HAVE BEEN REVIEWED WITH AND ARE UNDERSTOOD BY ALL JOB PERSONNEL

_____

_____

(Job personnel signatures)

The Building Manager (or designee) has been notified of upcoming work _____
(notifier's initials)

THE SIGNATURES BELOW INDICATE REVIEW AND CONCURRENCE WITH THE WORK PERMIT

_____ _____
Responsible User - visor

_____ _____
RPT Foreman (if applicable) Contractor Supervisor (if applicable)

_____ _____
H&S Area Engineer Other

SECTION VI - PERMIT EXTENSION

WORK PERMIT EXTENDED TO _____ _____
H&S Area Engineer

Job Supervisor agrees to tour area daily to ensure compliance with H&S requirements (Initials required for each day of extension)

Dates _____ _____ _____ _____ _____ _____ _____

Initials _____ _____ _____ _____ _____ _____ _____

DISTRIBUTION

Job Supervisor -	White (retain permanently with job file)
Responsible User -	Blue (retain for 30 days)
Radiological Protection	Yellow (retain for 30 days)
H&S Area Engineer-	Buff (info copy)

POST CARD AT JOB SITE

4.3 Job Personnel

Job personnel must comply with these requirements and the precautions specified on the Radiological/HS&E Work Permit.

4.4 HS&E Area Engineer

The HS&E Area Engineer reviews and signs all Radiological/HS&E Work Permits and ensures review by the HS&E disciplines and the Fire Department, when necessary.

4.5 Building Manager

The Building Manager, who is notified of all work covered by a Radiological/HS&E Work Permit shortly before the work begins, has the authority to modify or halt work plans.

5. REQUIRED PERMITS AND REVIEW

A Radiological/HS&E Work Permit is required for the following jobs:

5.1. Breaking the Primary Containment of a Radioactive System

When breaking the primary containment of a radioactive system, except for routine work which is covered by an HS&E-approved procedure.

Work permits for this type of work require concurrence from Radiation Protection.

5.2 Work Using Breathing Air

When personnel will perform work using breathing air, i.e., self-contained or supplied air, except for work which is covered by an HS&E-approved procedure.

5.3 Work Inside Plenums, Ducts, Gloveboxes

When personnel will be working inside plenums, ducts, or gloveboxes.

"Working inside" is interpreted as the entire body being inside the duct, glovebox or plenum. In such cases, the permit must be reviewed and signed by the Building Manager as the Responsible User.

5.4 Work on Air-Handling Systems, Air Stacks

For any work on air-handling systems, including opening of exhaust systems, or work on air stacks, etc; except for pre-filter changing of room-air exhaust ducts, heating, ventilating and supply plenums.

5.5 Glovebox and Hood Filter Changes

For glovebox and hood filter changing.

5.6 Work on Radioactive Sources

For any work on radiation-producing devices or systems containing radioactive sources except Alpha Mets and Combos (combination hand/foot checking instrument).

5.7 Exhaust and Plenum Filter Changing

For exhaust and recirculating plenum filter changing.

5.8 Physical Changes to Potable Water or Process Drainage

For any physical changes to potable water or process drainage.

5.9 Interruption of Environmental Samplers

For interruption of environmental samplers.

5.10 Work on Exposed Electrical Systems

For work on exposed electrical systems, as follows:

- o High voltage (>600 V-AC), energized or de-energized
- o Repair of any energized electrical system
- o Troubleshooting, testing, or calibrating any energized electrical system, except when both of the following two conditions are met:

  The work is performed by one of the following crafts: Alarm/Telecommunications Technician; Auto Mechanic/Vehicle Modification Mechanic (vehicles only); Electrician Technician; Electronics Technician; Lineman-Electrician; Electrician; Qualified Support Engineers; Metrology Technicians; and

  and

  The craftsperson/Qualified Support Engineer has been trained in safe work practices of electrical systems/equipment, is aware of electrical hazards and the necessary protective requirements, and the training is documented

5.11 Specified Interruption of Electric Power

For interruption of electric power affecting more than the piece of equipment being worked on, except for scheduled power outages.